

ABSTRACT

A practical orbit raising method and system wherein a satellite quickly escapes the Van Allen radiation belts and payload mass and mission life are maximized. A satellite is launched that contains high thrust chemical propulsion thrusters, high specific impulse electric propulsion thrusters and a solar array. The satellite quickly escapes the Van Allen radiation belts by firing the high thrust chemical propulsion thrusters at apogees of intermediate orbits, starting from the transfer orbit initiated by a launch vehicle, to successively raise the perigees until the perigee clears the Van Allen radiation belts. The payload mass and mission life are maximized by firing high specific impulse electric propulsion thrusters to raise the satellite to near synchronous orbit, while steering the thrust vector and solar array to maintain the sun's illumination on the solar array. The chemical and/or electric propulsion thrusters are then fired to achieve geosynchronous orbit.